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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/433,239 | 11/04/1999 | RICHARD HAROLD BOIVIE | YO999-459 | 2282 |

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| EXAMINER |
|---|
| LI, SHI K |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2633 | |

DATE MAILED: 11/29/2002    /0

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

| | Application No. | | Applicant(s) | |
|---|---|---|---|---|
| **Office Action Summary** | 09/433,239 | | BOIVIE, RICHARD HAROLD | |
| | Examiner | | Art Unit | |
| | Shi K. Li | | 2633 | |

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on <u>23 September 2002</u> .

2a) ☒ This action is **FINAL**.      2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) <u>1-39</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-13,20-22 and 27-39</u> is/are rejected.

7) ☒ Claim(s) <u>14-19 and 23-26</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☒ The proposed drawing correction filed on <u>23 September 2002</u> is: a) ☒ approved b) ☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
        application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)           4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .   6) ☐ Other: .

## DETAILED ACTION

### *Drawings*

1.      The corrected or substitute drawings were received on 23 September 2002. These

drawings are acceptable.

### *Claim Rejections - 35 USC § 112*

2.      The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making
> and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it
> pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
> contemplated by the inventor of carrying out his invention.

3.      Claim 38 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter

which was not described in the specification in such a way as to reasonably convey to one skilled

in the relevant art that the inventor(s), at the time the application was filed, had possession of the

claimed invention.  The limitation "said data packet traffic is devoid of packet headers" of the

claim is not supported by the specification as originally filed and considered as new matter.

### *Claim Rejections - 35 USC § 103*

4.      The text of those sections of Title 35, U.S. Code not included in this action can be found

in a prior Office action.

5.      Claims 1-2, 6, 8-13, 20-21, 29, 32, 34 and 36 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Xu et al. (S. Xu et al., " Dynamic Routing and Assignment of

Wavelength Algorithms in Multi-Fiber Wavelength Division Multiplexing Networks",

Proceedings of Eight International Conference on Computer Communications and Networks,

October 1999) in view of Brackett et al. (U.S. Patent 5,550,818) and Brackett (C. Brackett,

"Dense Division Multiplexing Networks: Principles and Applications", IEEE Journal on Selected

Areas in Communications, Vol. 8, No. 6, August 1990).

Regarding claims 1, 20, 32 and 34, Xu et al. discusses routing and assignment of

wavelength (RAW) and discloses an optical switch architecture in FIG. 1 with a plurality of

input links and output links in which a plurality of wavelengths are used to carry traffic.

Wavelength assignment is the labeling protocol and wavelength routing is the association of a

label with a destination where the label comprises a wavelength and a fiber number. This is

explained in prior arts, e.g., Brackett explains wavelength routing on p. 949, left col., paragraph

3 that the wavelength of the signal and the port through which it enters can be used to uniquely

identify, or label, the destination. The difference between Xu et al. and the claimed invention is

that Xu et al. does not explicitly include a controller in FIG. 1. Since Xu et al. discusses

algorithms for RAW, including a computing device acting as a controller is obvious, if not

inherent. For example, Patent '818 discloses a similar switch architecture in FIG. 8. Patent '818

discusses controller for the cross-connect (switching) module in col. 9, lines 32-51. A controller

allows the system to compute the routes, assign wavelengths to the routes, dynamically update

the routing table and manipulate the optical switch accordingly. Thus it would have been obvious

to one of ordinary skill in the art at the time the invention was made to include a controller in the

optical switching system of Xu et al. for computing the routes, assigning wavelengths to the

routes, updating the routing table and manipulating the optical switch accordingly, as taught by

Patent '818.

Regarding claim 2, Brackett shows a routing table in FIG. 3 where each entry in a row

has different wavelength.

Regarding claim 6, Xu et al. discusses multi-fiber networks without wavelength conversion (see p. 333, left col. paragraph 3) therefore when the switch directs traffic from an input link to an output link, the same wavelength is used on both the input link and the output link.

Regarding claims 8-10, Xu et al. suggests the use of a shortest path algorithm such as Dijkstra algorithm to find the routes (see p. 334, right col., first paragraph of Section III.B). It is well known that the Dijkstra algorithm generates a spanning tree from the network with the destination as the root.

Regarding claim 11, different shades of a same wavelength means the members of a group of wavelengths that has the same destination. The algorithms of Xu et al. can assign more than one wavelength to a destination. Since these wavelengths have the same destination, they merge.

Regarding claim 12, Xu et al. discloses multiple fibers in a cable (bundle) in FIG. 1. It is obvious that, without wavelength conversion, channels of same wavelength from different sources routed to the same output cable are carried on different fibers in a bundle.

Regarding claims 13 and 21, Xu et al. shows the input fiber bundles on the left-hand side of FIG. 1 and the output fiber bundles on the right-hand side of FIG. 1. An input/output (I/O) port has two fiber bundles, one for receiving traffic and one for transmitting traffic.

Regarding claim 29, the modified optical switching system is applicable to WAN as suggested by Patent '818 in col. 3, lines 35-36.

Claim 36 is rejected based on the same reason as claim 34. The preamble of these claims are not accorded any patentable weight because they merely recite the purpose of a process or the

intended use of a structure, and where the body of these claims do not depend on the preamble

for completeness but, instead, the process steps or structural limitations are able to stand alone.

See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150,

152, 88 USPQ 478, 481 (CCPA 1951).

6.      Claims 3-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et

al., Brackett and Patent '818 as applied to claims 1-2, 6, 8-13, 20-21, 29, 32, 34 and 36 above,

and further in view of Solgaard et al. (U.S. Patent 6,097,859).

Xu et al., Brackett and Patent '818 have been discussed above in regard to claims 1-2, 6,

8-13, 20-21, 29, 32, 34 and 36. Regarding claims 3 and 4, the difference between the modified

switching system of Xu et al., Brackett and Patent '818 and the claimed inventions is that Xu et

al., Brackett and Patent '818 do not specify the technology and mechanism of the switching

device. Solgaard et al. discloses a cross-connect switch using mirrors for reflecting light beams.

Large size switches can be built using this technology. Thus it would have been obvious to one

of ordinary skill in the art at the time the invention was made to use MEMS for the switching

device, as taught by Solgaard et al., in the modified switching system of Xu et al., Brackett and

Patent '818 because MEMS technology is capable of building large cross-connects.

Regarding claim 7, Xu et al. discusses multi-fiber networks without wavelength

conversion (see p. 333, left col. paragraph 3) therefore when the switch directs traffic from an

input link to an output link, the same wavelength is used on both the input link and the output

link.

7.      Claims 5, 22 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Xu et al., Brackett and Patent '818 as applied to claims 1-2, 6, 8-13, 20-21, 29, 32, 34 and 36

above, and further in view of Domash (U.S. Patent 5,937,115).

Xu et al., Brackett and Patent '818 have been discussed above in regard to claims 1-2, 6,

8-13, 20-21, 29, 32, 34 and 36. The difference between the modified switching system of Xu et

al., Brackett and Patent '818 and the claimed inventions is that Xu et al., Brackett and Patent '818

do not specify the technology and mechanism of the switching device. Domash discloses a light

steering optical switch using holographically polymerized polymer/liquid crystal composites.

Such a switch does not have moving parts and therefore highly reliable. Thus it would have been

obvious to one of ordinary skill in the art at the time the invention was made to use light steering

optical switch, as taught by Domash, in the modified switching system of Xu et al., Brackett and

Patent '818.

8.      Claims 30 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et

al., Brackett and Patent '818 as applied to claims 1-2, 6, 8-13, 20-21, 29, 32, 34 and 36 above,

and further in view of Crowcroft (J. Crowcroft, "IP over Photons: How not to waste the waist of

the Hourglass", 1999 Seventh International Workshop on Quality of Service, May 31-June 4,

1999).

Xu et al., Brackett and Patent '818 have been discussed above in regard to claims 1-2, 6,

8-13, 20-21, 29, 32, 34 and 36. Regarding claims 30, the difference between the modified

switching system of Xu et al., Brackett and Patent '818 and the claimed inventions is that Xu et

al., Brackett and Patent '818 do not specify the labeling protocol. Crowcroft suggests the use of

MPLS and LDP to distribute the mapping between wavelength and destination (see p. 10, first

paragraph of Section 4). MPLS is widely accepted in the IP industry and deploying MPLS

minimize the associated risk. Thus it would have been obvious to one of ordinary skill in the art

at the time the invention was made to use MPLS as the label protocol, as taught by Crowcroft, in

the modified optical switching system of Xu et al., Brackett and Patent '818 because it minimizes

the risk of deployment.

Regarding claim 39, the difference between Xu et al., Brackett and Patent '818 and the

claimed invention is that Xu et al., Brackett and Patent '818 do not make it clear that the

wavelengths (channels) are used to carry data packet. Crowcroft teaches that the wavelength

routing network can be used to carry IP packets. Since IP traffic grows rapidly and WDM

provides wide bandwidth (see Section 1 of Crowcroft), it is natural to use WDM to carry IP

traffic. Thus it would have been obvious to one of ordinary skill in the art at the time the

invention was made to use the modified optical switching system of Xu et al., Brackett and

Patent '818 to carry data packets, as taught by Crowcroft, because WDM can provide the

bandwidth required by the IP traffic growth.

9.      Claims 31, 33, 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Xu et al. (S. Xu et al., " Dynamic Routing and Assignment of Wavelength Algorithms in Multi-

Fiber Wavelength Division Multiplexing Networks", Proceedings of Eight International

Conference on Computer Communications and Networks, October 1999) in view of Brackett et

al. (U.S. Patent 5,550,818), Brackett (C. Brackett, "Dense Division Multiplexing Networks:

Principles and Applications", IEEE Journal on Selected Areas in Communications, Vol. 8, No. 6,

August 1990) and Stallings ("High-speed Networks: TCP/IP and ATM Design Principles" by W.

Stallings, Prentice-Hall, 1998, p. 414-421).

Regarding claims 31, 33 and 35, Xu et al. discusses routing and assignment of

wavelength (RAW) and discloses an optical switch architecture in FIG. 1 with a plurality of

input links and output links in which a plurality of wavelengths are used to carry traffic.

Wavelength assignment is the labeling protocol and wavelength routing is the association of a

label with a destination where the label comprises a wavelength and a fiber number. This is

explained in prior arts, e.g., Brackett explains wavelength routing on p. 949, left col., paragraph

3 that the wavelength of the signal and the port through which it enters can be used to uniquely

identify, or label, the destination. The difference between Xu et al. and the claimed invention is

that (a) Xu et al. does not explicitly include a controller in FIG. 1; (b) Xu et al. does not

explicitly state that the network nodes exchange routing information. Since Xu et al. discusses

algorithms for RAW, including a computing device acting as a controller is obvious, if not

inherent. For example, Patent '818 discloses a similar switch architecture in FIG. 8. Patent '818

discusses controller for the cross-connect module in col. 9, lines 32-51. A controller allows the

system to compute the routes, assign wavelengths to the routes, dynamically update the routing

table and manipulate the optical switch accordingly. Thus it would have been obvious to one of

ordinary skill in the art at the time the invention was made to include a controller in the optical

switching system of Xu et al. for computing the routes, assigning wavelengths to the routes,

updating the routing table and manipulating the optical switch accordingly, as taught by Patent

'818.

Regarding the exchanging of routing information, Stallings teaches that link-state

protocol such as OSPF can be used for calculating the shortest path, which is required by Xu et

al. (see p. 334, first paragraph of Section III.B). The exchanging of routing information allows

the network to dynamically update the network topology map stored in each node and calculate

the shortest path to any destination. Thus it would have been obvious to one of ordinary skill in

the art at the time the invention was made to use the controller to exchange routing information

with other nodes, as taught by Stallings, in the modified optical switching system of Xu et al.,

Brackett and Patent '818.

Claim 37 is rejected based on the same reason as claims 35. The preamble of these

claims are not accorded any patentable weight because they merely recite the purpose of a

process or the intended use of a structure, and where the body of these claims do not depend on

the preamble for completeness but, instead, the process steps or structural limitations are able to

stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187

F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

### *Allowable Subject Matter*

10.     Claims 14-19 and 23-26 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

### *Response to Arguments*

11.     Applicant's arguments with respect to claims 1-13 and 27-39 have been considered but

are moot in view of the new ground(s) of rejection.

### *Conclusion*

12.     Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The

examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jason Chan can be reached on 703 305-4729. The fax phone numbers for the

organization where this application or proceeding is assigned are 703 872-9314 for regular

communications and 703 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703 305-3900.

skl
November 20, 2002

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600